

Risks and Risk Factors of Repeated Suicidal Attempt: Study of Unconscious Poisoned Patients

BABAK MOSTAFAZADEH¹, ESMAIEL FARZANEH^{2,*}

¹Department of Forensic Medicine and Toxicology, Shahid Beheshti University of Medical Sciences, Tehran, Iran

²Department of Forensic Medicine and Toxicology, Ardabil University of Medical Sciences, Ardabil, Iran

Introduction: Most drug overdoses are due to suicidal attempts. This study was designed to analyze the risks and risk factors of poisoned patients with repeated suicidal attempt in Iran.

Methods: This case-control study was conducted at Lohman Hakim Hospital, Tehran, Iran, during April to May 2008. Eighty-seven patients who were admitted due to drug overdose with loss of consciousness were enrolled. Patients were categorized to cases including 19 patients with history of previous suicidal attempt (repeated suicidal attempt), and controls including 66 patients without this history. Only patients who consumed drugs for self-harm were included. Demographic characteristics, past medical history, baseline physical examinations, dose and class of drugs used were recorded.

Results: History of previous suicidal attempt had a significant association with the type of drugs used for poisoning ($P=0.04$) and history of psychological disorders ($P<0.01$). Dose of ingested drugs ($P=0.020$), time interval between drug ingestion and emergency medical service arrival ($P=0.021$), severity of unconsciousness ($P=0.046$) and need for ICU care ($P=0.013$) were significantly higher in patients with repeated suicidal attempt. There was no significant difference between the two groups in terms of age, gender and history of illicit substance abuse.

Conclusion: According to these findings, when dealing with patients with loss of consciousness due to drug overdose, those with history of previous suicidal attempt are in more risks and need significantly more attention compared to those without such history. Considering history of previous suicidal attempts in poisoned patients can help medical professionals in determining more definitive prognosis and more effective treatment plan.

Keywords: Drug overdose; Loss of consciousness; Suicidal attempt; Deliberate self-poisoning; Risk factor

INTRODUCTION

Drug overdose or intoxication, intentionally or accidentally, is one of the frequent causes of hospitalization. However, rates of drug overdose in different countries are greatly different (1,2). During recent decades, a significant increase in hospital admissions due to drug overdose has been reported, across the world (3-5). A major proportion of these poisoned patients are following completed suicides and parasuicides (6-9).

Parasuicidal behaviors are defined as all non-fatal suicidal behaviors including attempted and failed suicides, regardless of the intentional nature (10). The annual incidence of parasuicide in individuals over 15 years old has been estimated about 300-800 per 100,000 in Europe, with significant inter-country differences (11). Furthermore, parasuicidal behavior is an important risk factors for death, because about 30–60% of such cases repeat their suicidal attempts (12,13). Nevertheless, some researchers believe that these numbers are underreported since over 75% of non-fatal suicidal attempts are not incorporated in the official figures and statistics (14). Although, it has been believed that a previous suicide attempt increases the risk for a completed suicide (6,15), and repeated suicidal

attempts make a greater risk (16), very rare efforts have been made to describe what risks and risk factors are associated with repeated suicidal attempts. Moreover, most information about suicides has been reported from western countries, though it is a global dilemma (17).

This study was designed to analyze the risks and risk factors of poisoned patients with repeated suicidal attempt in Iran.

METHODS

Study design

This was a case-control study which was conducted during April and May 2008. Eighty-seven patients who were referred to emergency department of Lohman Hakim Hospital, Tehran, Iran, due to decreased level of consciousness with diagnosis of drug overdose were enrolled. These included patients who were not alert according to AVPU scale. Causes of loss of consciousness other than drug poisoning were ruled out. Study was done after receiving approval of ethical review committee. Informed consent was taken from all patients. Only patients who consumed drugs for self-harm were included. Patients were categorized into case and control groups regarding history of previous suicidal attempt; 19 patients with repeated suicidal attempt

*Correspondence to: Esmail Farzaneh, Department of Forensic Medicine and Toxicology, Ardabil University of Medical Sciences, Ardabil, Iran
Tel: +98 914 152 1639, E-mail: e.farzaneh@arums.ac.ir
Received 7 January 2013; Accepted 14 March 2013

or having history of previous suicidal attempt (S+) and 66 patients without history of previous suicidal attempt (S-).

Assessments

Following data were collected from all patients: age, gender, time interval between drug consuming and emergency medical services (EMS) arrival (EMS response time interval), basic physical examinations including vital signs and level of consciousness at EMS arrival, past medical history (psychological disorders and substance abuse history), properties of the drug used (dose and class of drug), need for ICU admission and outcome of initial treatments (change in level of consciousness). Level of consciousness was assessed at EMS arrival using the AVPU scale (an acronym from Alert, responsive to Verbal stimuli, responsive to Painful stimuli and Unresponsive) which is found to be a rapid reliable method to assess neurologic status of poisoned patients (18,19). Past medical history was obtained from relatives, entourage and also from patients after regaining consciousness. Psychological disorders of patients were determined by an experienced psychologist.

Drugs were arbitrarily categorized into four classes according to availability in Iran: illicit opioids (raw opium, heroin), opioid agonists used in maintenance therapy (methadone and buprenorphine), prescribable opioids (tramadol) and non-opioid medications. Patients who ingested multiple drugs of different types were excluded from this study.

Statistical analysis

Statistical analysis was done with Statistical Package of Social Sciences for Windows (SPSS Inc., Chicago, IL, USA). Quantitative variables were reported with mean (SD), and qualitative variables with frequency and percentage. For comparison between two groups, Chi-Square and Mann-Whitney U Test were used. P values of less than 0.05 were considered as significant.

RESULTS

General findings

In total, 66 (78%) patients were male and mean (SD) age of patients was 32.9 (9.4) ranging from 19 to 72 years. Distribution of type of drugs consumed in each group is shown in table 1. The most frequent drugs consumed by patients with repeated suicidal attempt was non-opioid medications (47%), whereas patients in control group were mainly poisoned due to overdose of illicit opioids (39%).

Comparison of factors between patients with and without history of previous suicidal attempt

There were no significant difference in age, gender, history of substance abuse, mean blood pressure, heart rate, temperature, respiratory rate between cases and controls ($P>0.05$) (Table 2). EMS response time interval ($P=0.021$) and severity of unconsciousness at first visit ($P=0.046$), were significantly higher in patients of S+ group. In addition, patients with history of psychological disorders were more likely to repeat their suicidal attempt ($P<0.001$). Comparing among patients who consumed tablet form of drugs, number of ingested tablets was significantly higher in patients with repeated suicidal attempt ($P=0.02$).

Improvement in level of consciousness after primary emergency care were significantly lower in S+ group ($P=0.027$) (Table 2). In addition, patients of S+ group required ICU care more frequently than S- group ($P=0.013$).

DISCUSSION

In this study, characteristics of patients who committed suicide by drug overdose with and without previous suicidal attempt were studied. It was found that a positive history of previous suicidal attempt puts patient to more risks and worse outcomes. Previous studies have shown that suicidal attempts are associated with multiple comorbidities including mood disorders (20,21). Moreover, some factors including tablet count and coma score have been defined as indicators of increased severity of self-poisoning. Carter et al. showed that an increase in ingested dose of tablets was highly associated with worse subsequent outcomes in self drug poisoned patients (22). Similarly, we found that patients with repeated suicidal attempt had deeper and persistent loss of consciousness while they ingested higher numbers of tablets. They also required ICU care more frequently. Moreover, EMS response time interval was longer in S+ patients which indicates that time elapsed from exposure to receiving first aid is an important determinant of severity of complications.

In this study, females accounted for less than one third of samples in both groups, which is contradictory to the findings of several other studies which showed that the prevalence of females in self-harm behaviors is higher (23-26). Although, higher female to male ratios have been found in all type of suicidal attempts, most females do less corporal impact self-harm gestures (27,28). We also found that psychological disorders were more common among

Table 1. Comparison of categories of drugs used for self-poisoning between patients with and without history of previous suicidal attempt

		With history of previous suicidal attempt (n; 19),	Without history of previous suicidal attempt (n; 66),	P value
		No. (%)	No. (%)	
Drug categories	Illicit opioids	4 (21)	26 (39)	0.041
	Prescribable opioids	6 (32)	10 (15)	
	Opioid agonists used in maintenance therapy	0 (0)	11 (17)	
	Non-opioid medications	9 (47)	19 (29)	

Table 2: Comparison of sociodemographic and clinical factors between patients with and without history of previous suicidal attempt

Determinant	With history of previous suicidal attempt (n; 19)	Without history of previous suicidal attempt (n; 66)	P value
Sex (male), No. (%)	14 (74)	52 (79)	0.638
History of psychological disorders, No. (%)	19 (100)	14 (21)	<0.001*
History of illicit drugs abuse, No. (%)	8 (42)	40 (61)	0.152
Deeper unconsciousness ¹ , No. (%)	8 (42)	13 (20)	0.046*
Need for ICU care, No. (%)	7 (37)	8 (12)	0.013*
Unimproved consciousness, No. (%)	10 (53)	17 (26)	0.027*
Age (years), mean (SD)	33.7 (10.1)	32.7 (9.2)	0.728
Mean blood pressure (mmHg), mean (SD)	78 (12)	83 (12)	0.168
Heart rate (beats/min)	89 (20)	82 (20)	0.171
Temperature (centigrade) ² , mean (SD)	37.0 (0.3)	37.0 (0.2)	0.808
Respiratory rate (breaths/min), mean (SD)	12 (2)	12 (3)	0.424
Ingested tablet count ³ , mean (SD)	40 (14)	30 (12)	0.020*
EMS response time interval (hours), mean (SD)	4.1 (2.1)	2.8 (1.9)	0.024*

¹ Level P and U according to AVPU scale

² Axillary temperature measurement

³ Cases who ingested tablet form of drugs

* Significant finding (P<0.05)

patients with repeated suicidal attempt, revealing psychological disorder as a great risk factor of repeating suicide attempts. This is consistent with previous studies which showed psychological disorder as a strong risk factor of suicide attempts (29,30).

Our findings showed that a previous suicidal attempt was accompanied with more complicated subsequent attempts; however, “trait” hypothesis proposes that the risk of a suicidal attempt is not related to previous suicidal attempts (31). Conversely, according to the “crescendo” hypothesis, a previous suicidal gesture increases the risk for future suicides (31). Nevertheless, most researchers believe that following a suicidal attempt, the mechanisms that are normally present and active to prevent individuals from making further attempts become less effective due to habituation (32). Also, it has been demonstrated that the suicidal act itself might have negative effects on the individuals and their surrounding environment, which can provoke future suicidal gestures (32).

According to the findings of this study, patients with repeated suicidal attempt were more commonly poisoned with non-opioid medications whereas illicit opioids were the most common drugs used by patients who attempted suicide for the first time. Similarly, frequent use of routine medicines for suicide has been reported by Alsen et al. (33). It has also been shown that at least half of the self-poisoned individuals applied prescription medicines (33), or the medicines used for treatment of their psychiatric disorders (28,34).

LIMITATIONS

Small sample size is one of limitations of the present study. In addition, information pertaining to past medical

history was obtained from interviews with the patients and their caregivers. Therefore, recall bias could be another limitation. The other limitations of this study were limited personal information about patients, lack of data on their socio-economic status and short-term follow-up of treatment outcomes.

CONCLUSION

According to these findings, when dealing with patients with decreased level of consciousness due to drug overdose, those with history of previous suicidal attempt are in more risks and need significantly more attention compared to those without such history. Considering history of previous suicidal attempts in poisoned patients can help medical professionals in determining more definitive prognosis and more effective treatment plan.

ACKNOWLEDGMENT

We would like to thank staff and members of forensic medicine and toxicology department of Shahid Beheshti University of Medical Sciences.

Conflict of interest: None to be declared

Funding and support: None

REFERENCES

1. Voyiaki S, Efstratopoulos A. Recent experience from an internal medicine clinic of a general hospital in Athens. Archives of the Hellenic Medical Society 1996;13(2):136-41.
2. Kessel N. Self-poisoning. I. Br Med J 1965 Nov 27;2(5473): 1265-70.
3. Dimakopoulou A, Rontos I, Spyropoulos I, Papamichael, E. Preliminary observations during the first year of running of Psychiatric Consultation Services in the Regional General

- Hospital of Nikea "Damon Vasiliou". *Encephalos* 1989;26:168-72.
4. Rygnestad T, Hauge L. Epidemiological, social and psychiatric aspects in self-poisoned patients. A prospective comparative study from Trondheim, Norway between 1978 and 1987. *Soc Psychiatry Psychiatr Epidemiol* 1991 Mar;26(2):53-62.
 5. Tountas C, Sotiropoulos A, Skliros SA, Kotsini V, Peppas TA, Tamvakos E, et al. Voluntary self-poisoning as a cause of admission to a tertiary hospital internal medicine clinic in Piraeus, Greece within a year. *BMC Psychiatry* 2001;1:4.
 6. Hawton K, Fagg J. Suicide, and other causes of death, following attempted suicide. *Br J Psychiatry* 1988 Mar;152:359-66.
 7. Owens D, Horrocks J, House A. Fatal and non-fatal repetition of self-harm. Systematic review. *Br J Psychiatry* 2002 Sep;181:193-9.
 8. Sakinofsky I. Repetition of suicidal behaviour. In: *The International Handbook of Suicide and Attempted Suicide*. Hawton K, van Heeringen K, editors. Chichester: Wiley; 2002. p.385-404.
 9. Hawton K, Zahl D, Weatherall R. Suicide following deliberate self-harm: long-term follow-up of patients who presented to a general hospital. *Br J Psychiatry* 2003 Jun;182:537-42.
 10. Mauri MC, Cerveri G, Volonteri LS, Fiorentini A, Colasanti A, Manfré S, et al. Parasuicide and drug self-poisoning: analysis of the epidemiological and clinical variables of the patients admitted to the Poisoning Treatment Centre (CAV), Niguarda General Hospital, Milan. *Clin Pract Epidemiol Ment Health* 2005 Apr 28;1(1):5. doi:10.1186/1745-0179-1-5
 11. Meehan PJ, Lamb JA, Saltzman LE, O'Carroll PW. Attempted suicide among young adults: progress toward a meaningful estimate of prevalence. *Am J Psychiatry* 1992 Jan;149(1):41-4.
 12. Hawton K. Assessment of suicide risk. *Br J Psychiatry* 1987 Feb;150:145-53.
 13. Diekstra RF. Suicide and suicide attempts in the European Economic Community: an analysis of trends, with special emphasis upon trends among the young. *Suicide Life Threat Behav* 1985 Spring;15(1):27-42.
 14. Diekstra RF. The epidemiology of suicide and parasuicide. *Acta Psychiatr Scand Suppl* 1993;371:9-20.
 15. Hawton K, Harriss L, Zahl D. Deaths from all causes in a long-term follow-up study of 11,583 deliberate self-harm patients. *Psychol Med* 2006 Mar;36(3):397-405.
 16. Zahl DL, Hawton K. Repetition of deliberate self-harm and subsequent suicide risk: long-term follow-up study of 11,583 patients. *Br J Psychiatry* 2004 Jul;185:70-5.
 17. Krug EG, Mercy JA, Dahlberg LL, Zwi AB. The world report on violence and health. *Lancet*. 2002 Oct 5;360(9339):1083-8.
 18. American College of Surgeons, Committee on Trauma. *Advanced Life Support Course for Physicians*. Chicago: American College of Surgeons; 1993.
 19. Kelly CA, Upex A, Bateman DN. Comparison of consciousness level assessment in the poisoned patient using the alert/verbal/painful/unresponsive scale and the Glasgow Coma Scale. *Ann Emerg Med* 2004 Aug;44(2):108-13.
 20. Powell J, Geddes J, Deeks J, Goldacre M, Hawton K. Suicide in psychiatric hospital in-patients. Risk factors and their predictive power. *Br J Psychiatry* 2000 Mar;176:266-72.
 21. Eagles JM, Klein S, Gray NM, Dewar IG, Alexander DA. Role of psychiatrists in the prediction and prevention of suicide: a perspective from north-east Scotland. *Br J Psychiatry* 2001 Jun;178:494-6.
 22. Carter G, Reith DM, Whyte IM, McPherson M. Repeated self-poisoning: increasing severity of self-harm as a predictor of subsequent suicide. *Br J Psychiatry* 2005 Mar;186:253-7.
 23. Bille-Brahe U. The role of sex and age in suicidal behavior. *Acta Psychiatr Scand Suppl* 1993;371:21-7.
 24. Buckley NA, Dawson AH, Whyte IM, Hazell P, Meza A, Britt H. An analysis of age and gender influences on the relative risk for suicide and psychotropic drug self-poisoning. *Acta Psychiatr Scand* 1996 Mar;93(3):168-71.
 25. Welch SS. A review of the literature on the epidemiology of parasuicide in the general population. *Psychiatr Serv* 2001 Mar;52(3):368-75.
 26. Batt A, Tron I, Depoivre C, Trehony A. Suicide attempts in Brittany (France). Distribution at the regional level. (in French) *Encephale* 1993 Nov-Dec;19(6):619-25.
 27. Stone IC. Observations and statistics relating to suicide weapons. *J Forensic Sci*. 1987 May;32(3):711-6.
 28. Maris RW, Berman AL, Silverman MM. *Comprehensive textbook of suicidology*. New York: Guilford Press; 2000.
 29. Goldston DB, Daniel SS, Erkanli A, Reboussin BA, Mayfield A, Frazier PH, et al. Psychiatric diagnoses as contemporaneous risk factors for suicide attempts among adolescents and young adults: developmental changes. *J Consult Clin Psychol* 2009 Apr;77(2):281-90.
 30. Beautrais AL. Risk factors for suicide and attempted suicide among young people. *Aust N Z J Psychiatry* 2000 Jun;34(3):420-36.
 31. Joiner TE Jr, Conwell Y, Fitzpatrick KK, Witte TK, Schmidt NB, Berlim MT, et al. Four studies on how past and current suicidality relate even when "everything but the kitchen sink" is covaried. *J Abnorm Psychol* 2005 May;114(2):291-303.
 32. Cassano GB, Pancheri P, Pavan L, Pazzagli A, Ravizza L, Rossi R, et al. *Trattato Italiano di Psichiatria [Italian Treatise on Psychiatry]*. (in Italian) Milan: Masson; 1999.
 33. Alsen M, Ekedahl A, Löwenhielm P, Niméus A, Regnéll G, Träskman-Bendz L. Medicine self-poisoning and the sources of the drugs in Lund, Sweden. *Acta Psychiatr Scand* 1994 Apr;89(4):255-61.
 34. Roy A. Characteristics of cocaine-dependent patients who attempt suicide. *Am J Psychiatry* 2001 Aug;158(8):1215-9.